

# Minimally invasive video-assisted thyroidectomy

Interventional procedures guidance  
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[www.nice.org.uk/guidance/ipg499](http://www.nice.org.uk/guidance/ipg499)

## 1 Recommendations

- 1.1 Current evidence on the efficacy and safety of minimally invasive video-assisted thyroidectomy is adequate to support the use of this procedure provided that normal arrangements are in place for clinical governance, consent and audit.
- 1.2 Patient selection is very important and, along with treatment, should only be done in units specialising in thyroid surgery.
- 1.3 Minimally invasive video-assisted thyroidectomy should only be done by clinicians with specific training and a regular practice in the procedure.

## 2 Indications and current treatments

- 2.1 Hyperthyroidism causes symptoms, which may include anxiety, weight loss, breathlessness, tiredness and eye problems. The overactive thyroid

is usually enlarged and visible (goitre). The most common cause of hyperthyroidism is Graves' disease, an autoimmune disease in which antibodies stimulate the thyroid cells to secrete excess thyroid hormone. Other causes include toxic adenoma and toxic multinodular goitre.

- 2.2 First-line treatment for hyperthyroidism includes medication to reduce the production of thyroxine or radioiodine treatment to destroy some of the thyroid tissue. Surgical removal of the thyroid (partial or total thyroidectomy) can be used if treatment with medication is unsuccessful, if radioiodine treatment cannot be used (for example, in pregnancy) or if the size of the gland is causing problems in the neck.
- 2.3 Thyroid cancer usually develops slowly and the most common first sign is a painless lump in the neck. Other symptoms include hoarseness, swollen lymph nodes in the neck, difficulty swallowing or breathing, and pain in the throat or neck. The most common types of thyroid cancer are papillary and follicular thyroid cancer.
- 2.4 The most common treatment for thyroid cancer is partial or total thyroidectomy. This is sometimes followed by radioactive iodine treatment or radiotherapy.
- 2.5 Conventional (open) thyroidectomy is done through a transverse neck incision, typically 4 to 8 cm long. Endoscopic techniques have been developed that use smaller incisions, with the aims of reducing pain after surgery and improving cosmesis.

## 3 The procedure

- 3.1 Minimally invasive video-assisted thyroidectomy is usually done with the patient under general anaesthesia. A small incision is made above the sternal notch. An endoscope is inserted through the incision and dissection of the thyroid lobe(s) is carried out. The operative space is maintained using external retraction: gas insufflation is not used. Care is taken to identify and preserve the recurrent laryngeal nerve.

## 4 Efficacy

This section describes efficacy outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [interventional procedure overview](#).

- 4.1 A non-randomised comparative study of 234 patients with papillary thyroid cancer treated by minimally invasive video-assisted thyroidectomy (MIVAT) or conventional (open) thyroidectomy reported that 87% (148/171) and 76% (38/50) of patients respectively were disease-free at mean follow-up of 3.6 years (no significant difference). There were no recurrences and no thyroid cancer-related deaths in either group. A non-randomised comparative study of 68 patients with papillary thyroid microcarcinoma treated by MIVAT or conventional thyroidectomy reported that there were no recurrences and no thyroid cancer-related deaths in either group during a mean follow-up of 5 years. A mixed case series of 300 patients with benign or malignant thyroid disease reported no recurrences after a mean follow-up of 12 months.
- 4.2 The non-randomised comparative study of 234 patients with papillary thyroid cancer reported that 7% (13/184) of MIVAT procedures were converted to conventional thyroidectomy. A case series of 833 patients reported that 2% (16/833) of MIVAT procedures were converted to conventional thyroidectomy. The case series of 300 patients reported that MIVAT was converted to open thyroidectomy in 1% (2/300) of patients with benign thyroid nodules and in 6% (18/300) of patients with malignancy, after frozen sections revealed differentiated thyroid carcinoma.
- 4.3 A systematic review of 9 studies including 581 patients, which compared 289 patients treated by MIVAT against 292 patients treated by conventional thyroidectomy for thyroid nodular disease, reported that pain scores (measured on a 10-point visual analogue scale [VAS], with higher scores indicating more severe pain) were lower 24 and 48 hours after surgery in patients treated by MIVAT than in those treated by conventional thyroidectomy (outcome reported in 5 studies; VAS at 24 hours 1.69 versus 3.39, standardised mean difference [SMD] -3.101, 95% confidence interval [CI] -4.840 to -1.361; VAS at 48 hours 1.05

versus 2.45, SMD -2.571, 95% CI -4.247 to -0.896,  $p < 0.0001$ ). There were no statistically significant differences 6 hours after surgery. A non-randomised comparative study of 982 patients with benign or malignant thyroid disease reported that pain scores were significantly lower 36 hours after surgery in patients treated by MIVAT than in patients treated by conventional thyroidectomy (1.1 versus 1.9,  $p < 0.05$ ).

- 4.4 The non-randomised comparative study of 982 patients reported higher satisfaction scores (scale 0 to 10, with higher scores being better) for MIVAT and for minimally invasive open thyroidectomy (using a smaller incision than conventional thyroidectomy) compared with conventional thyroidectomy (7, 8 and 5 respectively,  $p < 0.05$ ). A randomised study of 62 patients treated by MIVAT or robot-assisted transaxillary thyroidectomy reported significantly lower appearance and satisfaction with appearance scores on the Patient Scar Assessment Questionnaire (higher scores indicating poorer outcomes) in the MIVAT group (appearance score: 14 versus 17,  $p < 0.0001$ ; satisfaction with appearance score: 12 versus 16,  $p < 0.018$ ). The same study also reported significantly higher scores for the SF-36 domain of bodily pain (98 versus 81,  $p < 0.0005$ ) but lower scores for the SF-36 domains of social functioning (74 versus 90,  $p < 0.006$ ) and general health (79 versus 91,  $p < 0.0001$ ) in the MIVAT group (higher scores indicate less disability).
- 4.5 Voice and swallowing alterations scores (measured on a 10-point visual analogue scale, with 10 representing the worst possible outcome) 24 hours after surgery were significantly lower for patients treated by MIVAT than for patients treated by conventional thyroidectomy (1.5 versus 3.0,  $p < 0.01$ ) in the non-randomised comparative study of 68 patients.
- 4.6 The specialist advisers listed key efficacy outcomes as reduced pain after surgery, cosmesis and patient satisfaction.

## 5 Safety

This section describes safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [interventional procedure overview](#).

- 5.1 Overall postoperative morbidity rates (not further defined) of 10% (29/289) and 14% (42/292) were reported for minimally invasive video-assisted thyroidectomy (MIVAT) and conventional (open) thyroidectomy respectively (pooled odds ratio 0.65, 95% confidence interval 0.387 to 1.091,  $p=0.544$ ) in a meta-analysis of 9 studies including 581 patients (outcome reported in 7 studies).
- 5.2 Definitive monolateral recurrent laryngeal nerve palsy was reported in 1% (7/833), 2% (5/300) and 2% (2/116) of patients in case series of 833, 300 and 116 patients treated with MIVAT respectively.
- 5.3 Superior laryngeal nerve injury was reported in 2% (5/300) of patients in the case series of 300 patients.
- 5.4 Postoperative bleeding that needed reoperation was reported in less than 1% (1/833) and 4% (5/116) of patients in the case series of 833 and 116 patients respectively.
- 5.5 Wound sepsis was reported in less than 1% (2/833) of patients in the case series of 833 patients.
- 5.6 Permanent hypoparathyroidism was reported in 6% (2/34) of patients treated by MIVAT and 6% (4/65) of patients treated by conventional thyroidectomy in a non-randomised comparative study of 99 patients. Severe symptomatic hypoparathyroidism was reported in 2% (2/116) of patients in the case series of 116 patients.
- 5.7 Transient postoperative hypocalcaemia was reported in 4% (12/289 and 11/292) of patients treated by either MIVAT or conventional thyroidectomy respectively ( $p=0.9$ ) in the systematic review of 9 studies including 581 patients (outcome reported in 5 studies). Permanent hypocalcaemia needing substitutive therapy was reported in less than 1% (2/510 total thyroidectomies) of patients in the case series of 833 patients.
- 5.8 A skin burn was reported in 2% (5/300) of patients in the case series of 300 patients.

- 5.9 The specialist advisers listed the additional adverse event of neck haematoma.

## 6 Committee comments

- 6.1 The Committee was advised that minimally invasive video-assisted thyroidectomy needs skills additional to those of conventional (open) thyroid surgery, and that adequate training is very important for thyroid surgeons who wish to use this procedure.
- 6.2 The Committee was advised that this procedure is suitable only for the minority of patients with thyroid disease who need surgical treatment and whose thyroid glands are of appropriate size.

## 7 Further information

- 7.1 For related NICE guidance see the [NICE website](#).

## Information for patients

NICE has produced [information on this procedure for patients and carers](#). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

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## Endorsing organisation

This guidance has been endorsed by [Healthcare Improvement Scotland](#).

## Accreditation

